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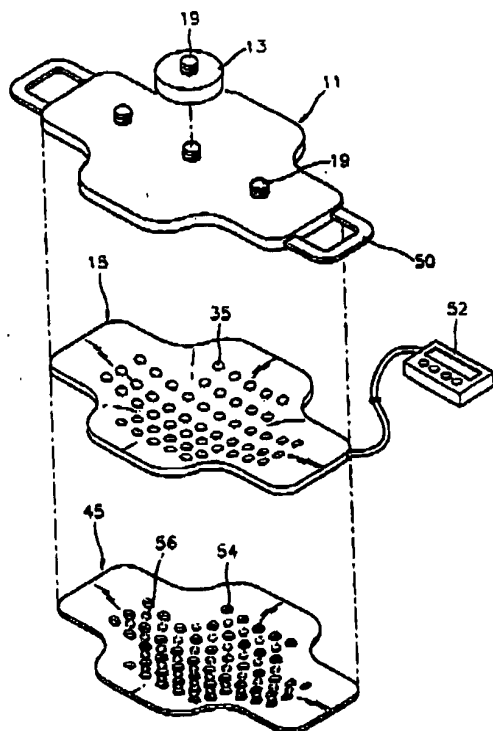
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[Continued on next page]

(54) Title: ABDOMINAL EXERCISER



(57) Abstract: An abdominal exerciser that can be conveniently applied on the abdomen of a user who is laying down flat is provided. By pushing the abdominal exerciser up and down using the abdominal muscles, abdominal muscles become toned and excess fat can be reduced. The abdominal exerciser includes a flexible plate having a plurality of projections on the bottom surface, for pushing the abdomen down by gravity, and a weight applying means fixed to the top surface of the flexible plate, for applying its weight to the abdomen.

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1. REPORT OF THE BOARD OF DIRECTORS

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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ABDOMINAL EXERCISER

Technical Field

The present invention relates to an abdominal exerciser, and more particularly, to an abdominal exerciser that can be conveniently applied on the abdomen of a user who is laying down flat. By pushing the abdominal exerciser up and down using the abdominal muscles, abdominal muscles become toned and excess fat can be reduced.

Background Art

Many people these days suffer from various geriatric diseases due to irregular dietary habits, work strains, and lack of exercise. Almost all geriatric diseases are caused by from obesity, and thus a variety of exercises and exercising devices have been suggested so as to eliminate the problems of obesity.

As well known, excess fat first accumulates on the abdomen. Most exercises applied to remove the subcutaneous fat begins with the exercising of other neighboring muscles, other than the abdomen muscles themselves. Thus, such indirect exercise techniques require a user to maintain a steady effort and endure for satisfactory results. Another drawback of the indirect technique lies in that it is not easy for a person with abdominal obesity to continue with such exercise for a long period of time, compared to an average weight person. This is because a person with an obesity problem has a difficult time doing such exercises. Therefore, there is a need for an exerciser that focuses the exercise activity on the abdominal muscles and can be applied conveniently by a user.

Disclosure of the Invention

To solve the above problems, it is an objective of the present invention to provide an abdominal exerciser that can be conveniently applied to the abdomen while a user is laying flat, whereby by pushing the abdominal exerciser up and d wn with a predetermined force using the

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abdominal muscles, intestinal fat as well as the subcutaneous fat around the abdominal muscles "burns" within a shorter period of time. In addition, the abdominal exerciser can facilitate the vermicular movement of the intestines, thereby relieving constipation.

5 The objective of the present invention is achieved by an abdominal exerciser comprising: a flexible plate having a plurality of projections on the bottom surface, for pushing the abdomen down by gravity; and a weight applying means fixed to the top surface of the flexible plate, for applying its weight to the abdomen.

10 Preferably, the bottom surface of the flexible plate, which has the plurality of projections, is convex.

Preferably, at least one male screw is fixed to the top surface of the flexible plate, and the weight applying means is at least one weights to be engaged with the male screw.

15 Preferably, the weight applying means comprises a filling for providing weight, and a weight retainer fixed to the top surface of the flexible plate, for holding the filling therein, and the filling comprises metal or mineral.

20 Preferably, the projections are formed of a mineral capable of emitting far infrared rays, and the abdominal exerciser further comprises a thermal keeping plate below the flexible plate, for keeping the temperature of the abdomen, the thermal keeping plate including a plurality of permanent magnets arranged therein.

25 Preferably, the abdominal exerciser further comprises a heat emitting plate between the flexible plate and the thermal keeping plate, for producing heat with application of electricity.

Preferably, the abdominal exerciser further comprises a pair of grips at both ends of the flexible plate.

Brief Description of the Drawings

30 FIG. 1 is a perspective view illustrating the configuration of a first embodiment of an abdominal exerciser according to the present invention;

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FIG. 2 is a perspective view showing in greater detail the bottom surface of a flexible plate of the abdominal exerciser shown in FIG. 1;

FIG. 3 is a sectional view of an example of the assembly of the abdominal exerciser according to the first embodiment of the present invention;

FIG. 4 is a sectional view showing another example of the flexible plate of the abdominal exerciser shown in FIG. 4;

FIG. 5 is an exploded perspective view illustrating the configuration of a second embodiment of an abdominal exerciser according to the present invention;

FIG. 6 is a section view of an example of the assembly of the abdominal exerciser according to the second embodiment of the present invention;

FIG. 7 is a sectional view showing another example of a flexible plate of the abdominal exerciser according to the second embodiment of the present invention; and

FIG. 8 illustrates a hybrid configuration of the abdominal exercisers according to the first and second embodiments of the present invention.

Best mode for carrying out the invention

As shown in FIG. 1, a first embodiment of an abdominal exerciser according to the present invention includes a flexible plate 11 for pushing the abdomen down by gravity when it rests on the abdomen of a user who is laying flat, a plurality of weights 13 installed on the top surface of the flexible plate 11, a heat emitting plate 15 placed below the flexible plate 11, and a thermal keeping plate 45. Here, the bottom surface of the flexible plate 11 refers to the surface facing the abdomen.

The flexible plate 11 has a planar cross shape, and thus the width of the flexible plate 11 is wider at the center than at both ends. The top surface of the flexible plate 11 is planar, while the bottom surface of the flexible plate 11 is convex, as shown in FIG. 2. The planar surface of the flexible plate 11 is helpful in retaining the weight 13 thereon, and the

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convex bottom surface of the flexible plate 11 allows the abdomen to be flexed deeply.

Preferably, the flexible plate 11 is formed of plastic, acryl resin or carbon cloth, and the thickness of the flexible plate 11 at the edge is in the range of 5 to 20 mm. Although the material used for the flexible plate 11 has intrinsic elasticity, the flexible plate 11 made from the material also has a rigid property with a predetermined thickness. Thus, the flexible plate 11 is not locally bent but slightly curved by an external force.

Although the flexible plate 11 is formed in a cross shape in the present embodiment, the shape of the flexible plate 11 vary. For example the shape may be in the form of a rectangle, ellipse or polygon.

The flexible plate 11 has a pair of grips 50 at both ends. The grips 50 allow the user to easily move the flexible plate 11 in a horizontal direction on the abdomen to position the flexible plate 11 in place, and allows easy carrying of the flexible plate 11.

Three male screws 19 are fixed to the top surface of the flexible plate 11 perpendicularly, and are engaged with female screws (not shown) threaded at the lower part of each weight 13. Although three male screws 19 are provided in the present embodiment, it will be appreciated that the number of the male screws installed on the flexible plate 11 may vary.

Combining all male screws 19 with the corresponding number of weights 13 is not necessary. In other words, the number of weights 13 to be coupled with male screws 19, and which male screw 19 are to be combined with the weight 13 can be determined by the user depending on the physical conditioning of the user.

A male screw 19 is also provided on the top of each weight 13. The male screw 19 is the same as the male screw 19 fixed to the top surface of the flexible plate 11. The male screw 19, which is able to support a weight 13, allows stacking of the weights 13, thereby flexing the abdomen with greater force.

The heat emitting plate 15 and the thermal keeping plate 45 are positioned below the flexible plate 11. The heat emitting plate 15 is a

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known means for generating heat with the application of electricity. As the abdominal exerciser according to the present invention rests on the abdomen of a user for exercise, the heat emitting plate 15 generates heat to warm the subcutaneous layer and intestine. The temperature of the heat emitting plate 15 is adjusted by a thermocontroller 52. Alternatively, the heating of the heat emitting plate 15 by the thermocontroller 52 can be suspended as needed. Furthermore, the heat emitting plate 15 may be not installed such that the heat emitting plate 11 directly contact the thermal keeping plate 45.

10 The heat emitting plate 15 has a plurality of apertures 35. The apertures 35 pass projections 17 (see FIG. 2) formed on the bottom surface of the flexible plate 11 to allow contact with the abdominal skin.

The thermal keeping plate 45 is formed of leather or textile, and is placed in contact with bottom surface of the heat emitting plate 15. When the heat emitting plate 15 is not incorporated into the abdominal exerciser, as previously mentioned, the thermal keeping plate 15 is placed in contact with the bottom surface of the flexible plate 11. The thermal keeping plate 45 has a plurality of apertures 54 which pass through the projections 17 of the flexible plate 11.

20 The thermal keeping plate 45 includes a plurality of permanent magnets 56. The permanent magnets 56, which are of disk type in the present embodiment, are arranged over and in the thermal keeping plate 45. The permanent magnets 56 generate and infiltrate magnetic field into the subcutaneous fat, thereby facilitating blood circulation. In addition, the thermal keeping plate 45 keeps the abdomen pressed by the flexible plate 11 warm, which prevents heat generated from the abdomen from dissipating and allows sweat at the abdomen. Furthermore, the thermal keeping plate 45 protects the abdomen from the chill of the flexible plate 11.

30 It is preferable that the thermal keeping plate 45 is formed of a material with skin-like physical properties, for example, synthetic or natural leather.

FIG. 2 is a perspective view illustrating the bottom surface of the

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flexible plate of the abdominal exerciser shown in FIG. 1 in greater detail.

Referring to FIG. 2, the bottom surface of the flexible plate 11 is entirely curved outwards, and a plurality of projections 17 extend from the surface. As the flexible plate 11 is pushed down on the abdomen, the
5 projections 17 attack the subcutaneous fat and blood vessels, thereby activating flow of blood and energy. Here, the tips of the projections 17 are round. The convex bottom surface of the flexible plate 11 aids in pushing the abdomen deep down, as previously mentioned.

FIG. 3 is a sectional view of the abdominal exerciser, in which the
10 flexible plate 11, the heat emitting plate 11 and the thermal keeping plate 14 are sequentially stacked is shown.

As shown in FIG. 3, a plurality of weights 13 fixed to the top surface of the flexible plate 11 provide a predetermined weight to the flexible plate 11 to push the abdomen down. In addition, the weights 13 can be layered
15 as shown in FIG. 3, and thus pressure applied to the abdomen can be controlled according to the need of the user.

The heat emitting plate 15 and the thermal keeping plate 45 are attached in sequence close to the bottom surface of the flexible plate 11. A plurality of permanent magnets 56 are present in the thermal keeping
20 plate 45, which provides a magnetic field to the abdomen.

The projections 17 of the flexible plate 11 protrude downward through the apertures 35 and 54 of the heat emitting plate 15 and the thermal keeping plate 45, and directly contact the skin. The projections 17 protrude on the order of 3 to 10 mm relative to the bottom of the heat
25 insulating plate 45.

FIG. 4 shows another example of the flexible plate of the abdomen exerciser shown in FIG. 1.

Unlike the projections 17 that extend from the bottom surface of the flexible plate 11 shown in FIG. 3, projection members 72 present in the
30 bottom surface of a flexible plate 58 are formed of a material different from that used for the flexible plate 58, and then attached to the bottom surface of the flexible plate 58. The material used for the projection members 72

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may be any of minerals capable of emitting far infrared rays, including germanium (Ge) and jade.

As well known, far infrared rays are effective in reinvigorating a tired human body and relieving his or her chronic fatigue. Thus, as the abdomen
5 is irradiated with far infrared rays, far infrared rays infiltrate into the subcutaneous fat, thereby increasing the exercising effect of the abdominal muscles.

The flexible plate 58 is formed of the same material used for the flexible plate 11 of FIG. 3. Although not shown in FIG. 4, it will be
10 appreciated that a plurality of weights are mounted on the top surface of the flexible plate 58, and a heat emitting plate and a thermal keeping plate are coupled with the flexible plate 58 through the projection members 72 formed at the bottom surface.

FIG. 5 is an exploded perspective view of a second embodiment of
15 an abdominal exerciser according to the present invention. In FIG. 5, like reference numerals are used to refer to like elements of FIG. 1.

Referring to FIG. 5, the abdominal exerciser includes a planar flexible plate 60, a weight retainer 39 to be seated on the top of the flexible plate 60, a filling 43 that fills the weight retainer 39 to give weight, and a
20 heat emitting plate 62 and a thermal keeping plate 64, which are placed close to the bottom surface of the flexible plate 60.

Similar to the first embodiment described with reference to FIG. 1, the flexible plate 60 has a width wider at the center than at both ends, which allows complete covering of the abdomen of the user. However, the
25 bottom surface of the flexible plate 60 of the present embodiment is flat. Preferably, the thickness of the flexible plate 60 is in the range of 5 to 20 mm. The flexible plate 60 is formed of the same material used for the flexible plate 11 in the first embodiment.

A pair of grips 50 are fixed to both ends of the flexible plate 60. A
30 plurality of projections 17 (see FIG. 6) are formed at the bottom surface of the flexible plate 60. The projections 17 have round tips and attack the subcutaneous fat and blood vessels.

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The heat emitting plate 62 fitted to the bottom surface of the flexible plate 60 provides the same function as that of the heat emitting plate 15 of the first embodiment, and has a plurality of apertures 35 for passing through the projections 17 of the flexible plate 60. A thermal keeping plate 5 64 placed in contact with the heat emitting plate 62 also has a plurality of apertures 54 for passing through the projections 17. Alternatively, the heat emitting plate 62 may be not installed, such that the thermal keeping plate 64 directly contacts the bottom surface of the flexible plate 60.

The weight retainer 38 seated on top of the flexible plate 60 is 10 formed of plastic, acryl resin or carbon cloth, and is divided into three parts with partitions 47. The internal space of each of the three parts is filled with the filling 43 that is heavy enough to give a predetermined weight to the abdomen. The filling 43 serves as the weights 13 described in the first embodiment with reference to FIG. 1.

15 The internal space of the three parts of the weight retainer 38 are sealed from the outside, and thus the filling 43 is not drawn out of the weight retainer 38. The filling 43 may be a material that is heavy enough to give a predetermined weight to the abdomen, such as metal or mineral. Examples of the mineral include germanium (Ge), jade, loess and sand. 20 Because the internal spaces of the weight retainer 38 are sealed from the outside, the filling 42 can be in the form of a lump or powder.

Although the weight retainer 38 is divided into three parts in the present embodiment, it will be appreciated that the number of the parts within the weight retainer 38 can be varied.

25 FIG. 6 is a sectional view of the abdominal exerciser shown in FIG. 5.

As shown in FIG. 6, the plurality of projections 17 protrude downwards from the bottom surface of the flexible plate 60 through the apertures 35 and 54 of the heat emitting plate 62 and the thermal keeping 30 plate 64. Preferably, the projections 17 protrude on the order of 3 to 10 mm relative to the bottom surface of the thermal keeping plate 64.

A plurality of permanent magnets 56, which produce and infiltrate

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magnetic field into the subcutaneous fat of the abdomen, are included in the thermal keeping plate 64. In the abdominal exerciser, the permanent magnets 56 and the projections 17 are alternately arranged. The weight retainer 39 on the flexible plate 60 is filled with the filling 43, and pushes
5 the flexible plate 60 down.

FIG. 7 shows another example of the flexible plate adopted in the abdominal exerciser of FIG. 5.

Unlike the projections 17 that extend from the bottom surface of the flexible plate 60 shown in FIG. 6, projection members 72 present in the
10 bottom surface of a flexible plate 70 are formed of a material different from that used for the flexible plate 70, and then attached to the bottom surface of the flexible plate 70. The material used for the projection members 72 may be any of known minerals capable of emitting far infrared rays, including germanium (Ge) and jade.

15 Although not shown in FIG. 7, it will be appreciated that the weight retainer 39 filled with the filling 43 is placed on the flexible plate 70, and a heat emitting plate and a thermal keeping plate are coupled with the flexible plate 70 through the projection members 72 formed at the bottom surface.

When the abdomen exerciser having the above configuration, for
20 example, equipped with the flexible plate 60 or 70, is positioned on the abdomen of a user, the projections 17 or the projection members 72 are made to contact the abdomen by the weight of the filling 43, and magnetic field from the permanent magnets 56, and/or far infrared rays from the projection members 72 infiltrate into the subcutaneous layer, thereby
25 stimulating the blood vessels and activating the flow of blood in the subcutaneous fatty layer.

As the user is laying down flat and breaths from the abdomen with the abdominal exerciser on the abdomen, the abdominal exerciser is moved upward and downward, and in turn the subcutaneous fatty layer is slowly
30 burned with time. At this time, heat generated from the abdomen is kept by the thermal keeping plate fitted to the bottom surface of the flexible plate, which allows the user to sweat while exercising, similar to being in a steam

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room. Furthermore, the abdomen can be heated for more effective exercise with the heat emitting plate as needed.

FIG. 8 illustrates a combination of the flexible plate 11 of the first embodiment with the weight retainer 39 of the second embodiment.

5 As shown in FIG. 8, the weight retainer 39 filled with the filling 43, instead of the weights 13, is fitted to the top surface of the flexible plate 11 having the convex bottom surface, so as to apply a predetermined weight to the abdomen. Alternatively, the flexible plate 60 having the planar bottom surface of the second embodiment may be combined with the
10 weights 13 of the first embodiment. In other words, any type of weight whose weight is sufficient to apply a predetermined pressure through the flexible plate to the abdomen can be utilized.

The effect of the abdominal exerciser according to the present invention was evidenced by the inventors. The results are shown in Table
15 1.

Table 1

Gender	Abdominal Obesity Index before Exercising	Exercising Period of Time with Abdominal Exerciser (weeks)					
		1	2	3	4	5	6
Male	1.2	1.1	1.05	1.05	1.0	1.0	1.0
	1.5	1.4	1.35	1.3	1.25	1.2	1.1
Female	1.2	1.1	1.05	1.0	0.95	0.9	0.9
	1.4	1.3	1.35	1.3	1.2	1.2	1.15

20 In Table 1, the abdominal obesity index refers to a waist-to-hip measure ratio. In the United States, the base line for abdominal obesity evaluation is 0.95 or more for males, and 0.8 or more for females. In Europe, the base line is 0.9 or more for males and 0.8 or more for females.

In Korea, a reliable base line for abdominal obesity evaluation has
25 not been established yet. However, in practice, if the abdominal obesity index is 1.0 or more for males, and 0.9 or more for females, it is determined

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to be abdominal besity.

As shown in Table 1, the abdominal obesity index starts to decrease after just 1-week of use of the exerciser. Also, after 4-week of use of the exerciser, the abdominal obesity index drops to almost the same level as
5 a normal condition.

While this invention has been particularly shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made thereto without departing from the spirit and scope of the invention as
10 defined by the appended claims.

Industrial Applicability

As previously mentioned, the abdominal exerciser according to the present invention can be effectively utilized in burning subcutaneous fatty layer around the abdominal muscles by just letting a user take breaths while
15 laying flat with the abdominal exercisers having a predetermined weight on his or her abdomen. As a result, excess fat around the abdomen can be easily decomposed within a short period of time. In addition, use of a heat emitting plate and permanent magnets activate movement of the intestines and the flow of blood during exercising, which enables to decompose
20 intestinal fat and activate a function of the intestines. As a result, digestion and absorption in the human body facilitates, and constipation can be relieved.

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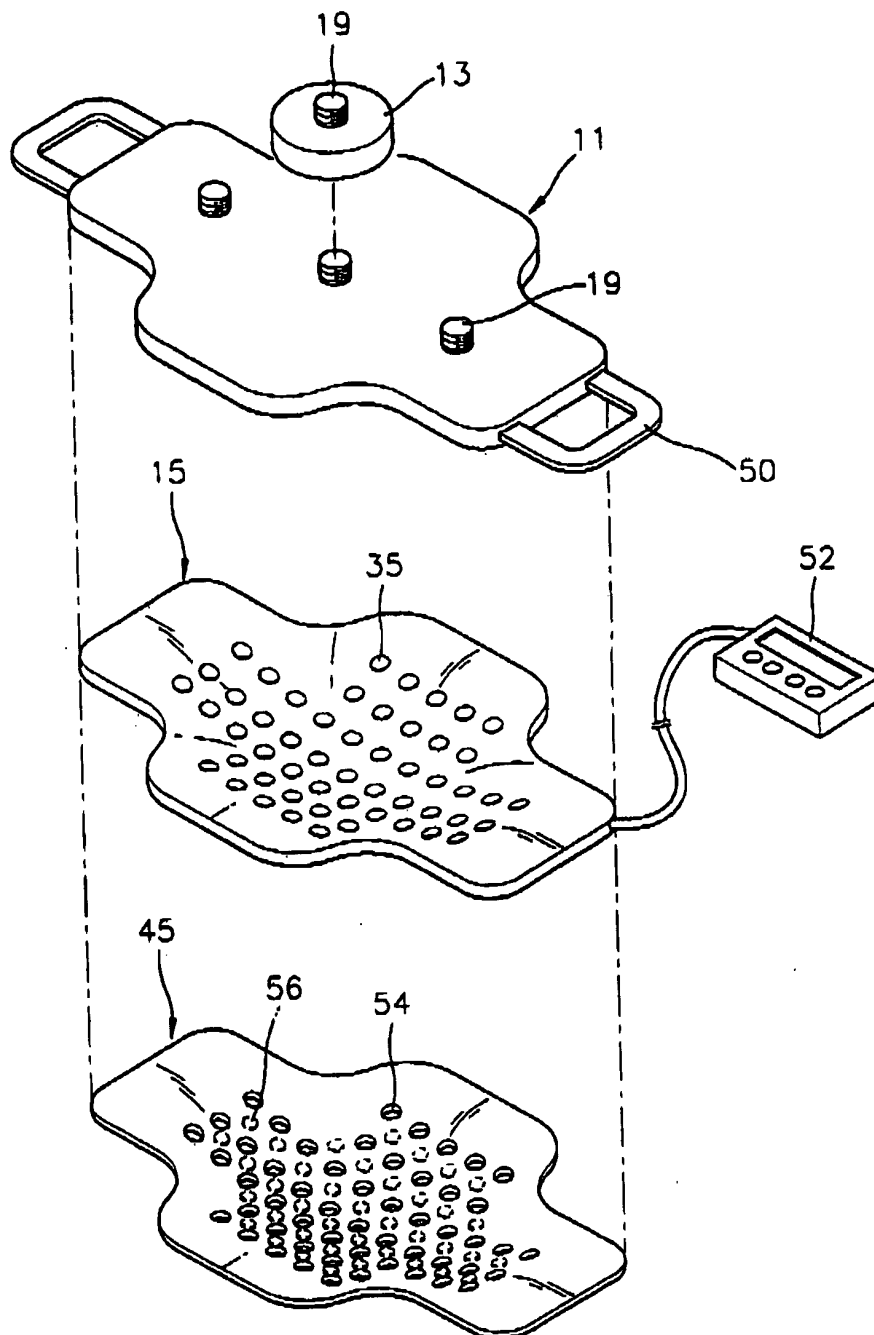
What is claimed is:

- 1 1. An abdominal exerciser comprising:
2 a flexible plate having a plurality of projections on the bottom
3 surface, for pushing the abdomen down by gravity; and
4 a weight applying means fixed to the top surface of the flexible plate,
5 for applying its weight to the abdomen.
- 1 2. The abdominal exerciser of claim 1, wherein the bottom
2 surface of the flexible plate, which has the plurality of projections, is convex.
- 1 3. The abdominal exerciser of claim 1 or 2, wherein at least one
2 male screw is fixed to the top surface of the flexible plate, and the weight
3 applying means is at least one weights to be engaged with the male screw.
- 1 4. The abdominal exerciser of claim 1 or 2, wherein the weight
2 applying means comprises a filling for providing weight, and a weight
3 retainer fixed to the top surface of the flexible plate, for holding the filling
4 therein, and the filling comprises metal or mineral.
- 1 5. The abdominal exerciser of claim 1 or 2, wherein the
2 projections are formed of a mineral capable of emitting far infrared rays,
3 and the abdominal exerciser further comprises a thermal keeping plate
4 below the flexible plate, for keeping the temperature of the abdomen, the
5 thermal keeping plate including a plurality of permanent magnets arranged
6 therein.
- 1 6. The abdominal exerciser of claim 5, further comprising a heat
2 emitting plate between the flexible plate and the thermal keeping plate, for
3 producing heat with application of electricity.
- 1 7. The abdominal exerciser of claim 1 or 2, further comprising a
2 pair of grips at both ends of the flexible plate.

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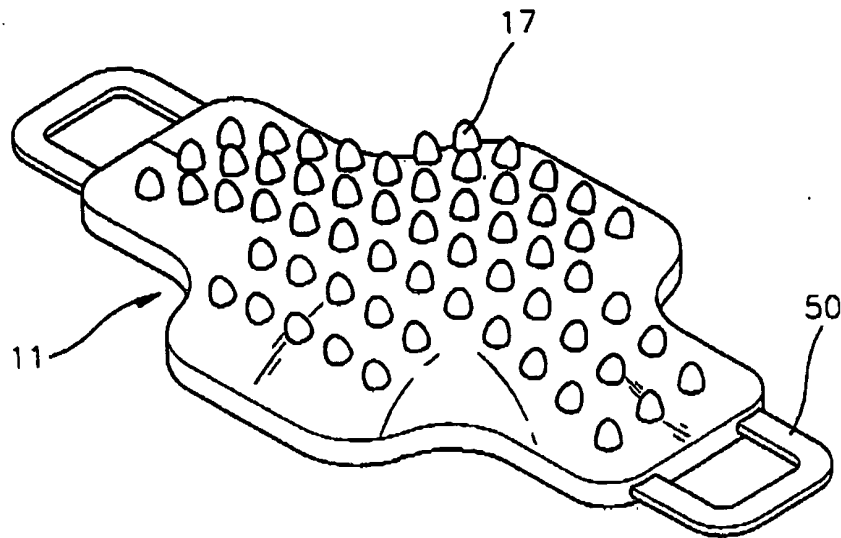
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FIG. 1



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FIG. 2



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FIG. 3

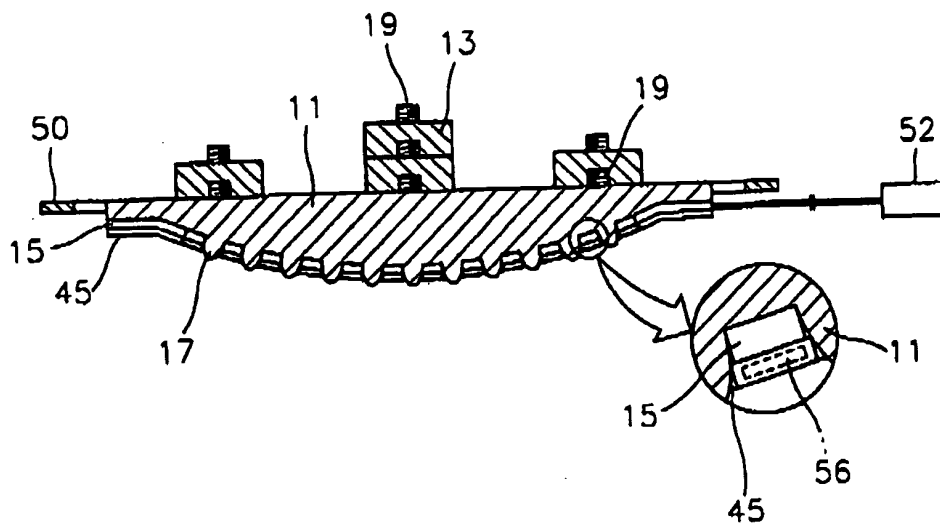
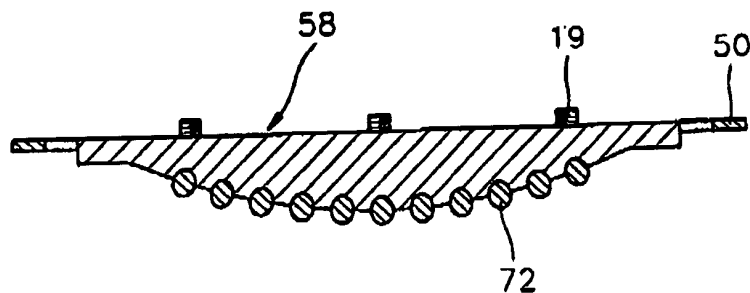


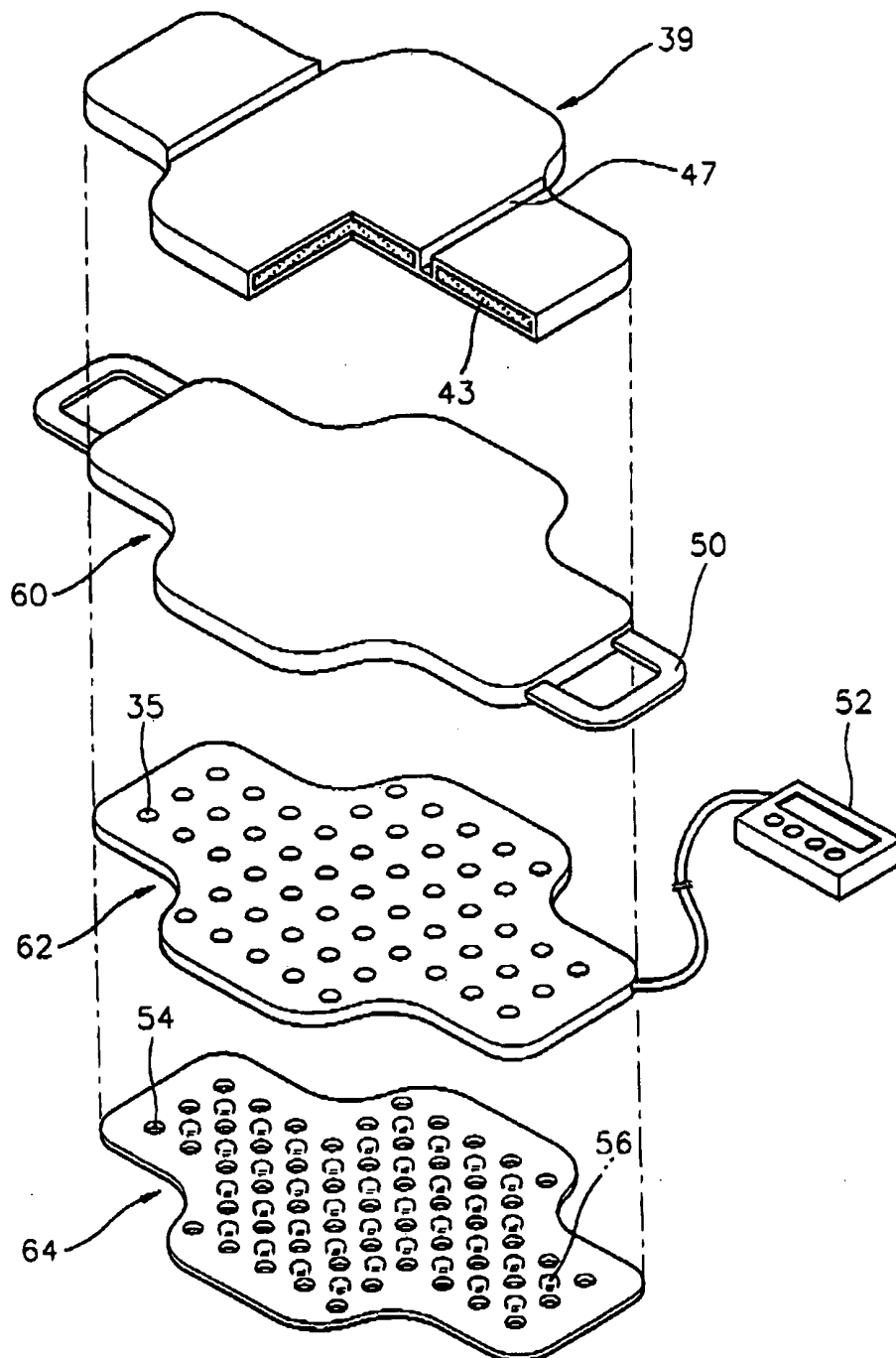
FIG. 4



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FIG. 5



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FIG. 6

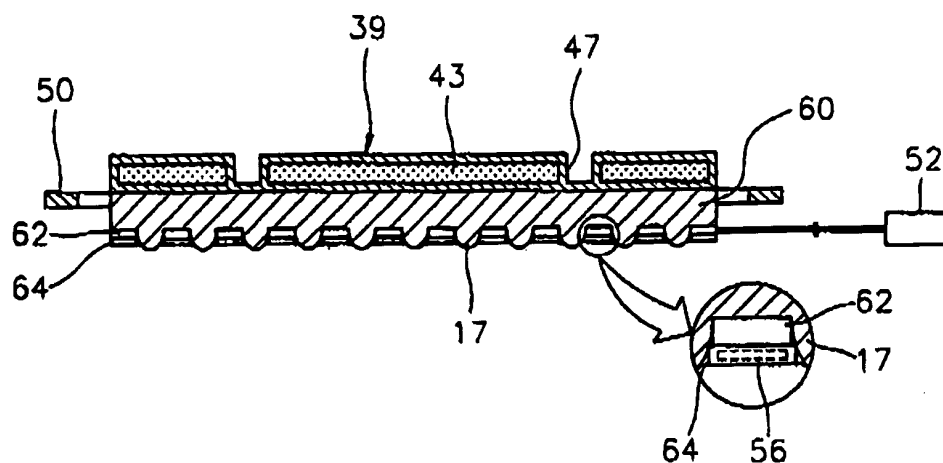
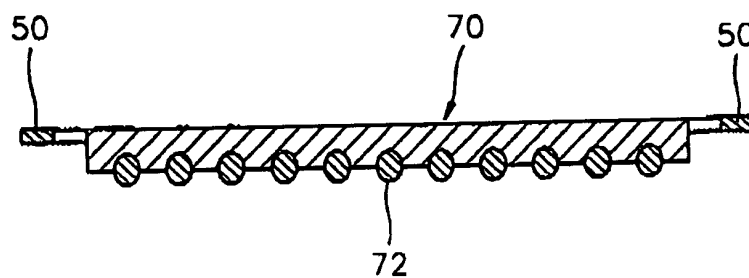


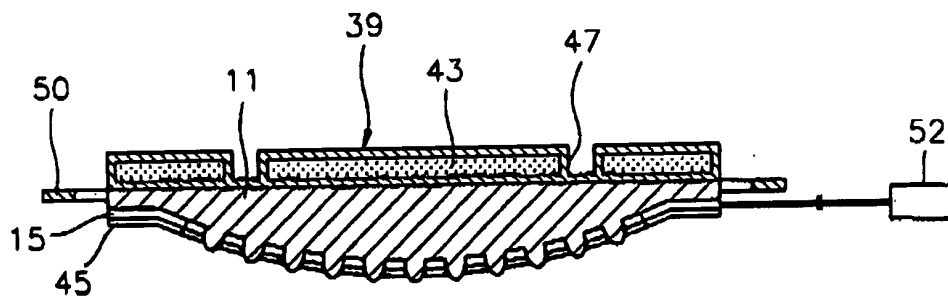
FIG. 7



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FIG. 8



INTERNATIONAL SEARCH REP RT

 international application No.
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A. CLASSIFICATION OF SUBJECT MATTER IPC7 A61H 23/00 39/04 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC7 A61F 5/02, A61H 23/00, 39/04, A61N 5/06 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korea utility models and applications for utility models since 1975 Japanese utility models and applications for utility models since 1975 Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) NPS		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 7-236680 A (SHIGEMORI YOJIRO) 12 SEPTEMBER 1995 see column 25-28	1,4,5
Y		6,7
Y	JP 5-12749 U (ARAKOU MISADORIKOU) 27 JUNE 1995 see claim 1	1-3
Y	EP 603,452 A1 (LANZONI LUCIANO) 29 JUNE 1994 see column 1 line 26-line 31 claim 1	1-3, 6,7
A	US 4,964,401 A (TAJGEN ROGER L.) 23 OCTOBER 1990 see column 2 line 48-line 54	1,7
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
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Date of the actual completion of the international search 06 DECEMBER 2000 (06.12.2000)		Date of mailing of the international search report 08 DECEMBER 2000 (08.12.2000)
Name and mailing address of the ISA/KR Korean Industrial Property Office Government Complex-Taejeon, Dunsan-dong, So-ku, Taejeon Metropolitan City 302-701, Republic of Korea Facsimile No. 82-42-472-7140		Authorized officer CHOI, Seung Keun Telephone No. 82-42-481-5575

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR00/00915

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 7-2366800 A	12. 9. 1995	None	
JP 5-12749 U	27. 6. 1995	None	
EP 603,452 A1	29. 6. 1994	None	
US 4,964,401 A	23. 10. 1990	None	